

What Is Claimed Is:

1. A flow-through pressure regulator, comprising:
 - a housing having an inlet and an outlet disposed along a longitudinal axis;
 - a divider separating the housing into a first chamber and a second chamber, the divider including:
 - a seat defining a passage between the first and second chambers, the passage having a flow area;
 - a diaphragm extending between the housing and the seat;
 - a retainer securing the diaphragm to the seat, the retainer including:
 - a base portion proximate the seat;
 - an intermediate portion extending along the longitudinal axis from the base portion toward the outlet;
 - an end portion extending from the intermediate portion;
 - and
 - at least one aperture having a flow axis, the aperture having a flow area that is less than the passage flow area, the aperture permitting fluid communication between the passage and the second chamber; and
 - a flow diffuser member between the passage and the outlet, the flow diffuser member defining a plurality of flow paths, each of the flow paths having a flow area that is less than the aperture flow area; and
 - a closure member being arranged between first and second configurations relative to the seat, the first configuration substantially preventing fluid communication through the passage, and the second configuration permitting fluid communication through the passage.
2. The flow-through pressure regulator of claim 1, wherein the flow diffuser member includes a plurality of segments forming a grid, the segments defining the plurality of flow paths.

3. The flow-through pressure regulator of claim 2, wherein the segments are formed of wire.
4. The flow-through pressure regulator of claim 3, wherein the segments are woven to form the grid.
5. The flow-through pressure regulator of claim 1, wherein the flow diffuser member is a mesh screen.
6. The flow-through pressure regulator of claim 1, wherein the flow diffuser member is formed as a unitary member, the plurality of flow paths being formed in the unitary member.
7. The flow-through pressure regulator of claim 2, wherein the flow diffuser member is disposed between the passage and the at least one aperture.
8. The flow-through pressure regulator of claim 7, wherein the flow diffuser member is circular in form, having an outer diameter that is longer than an inner diameter of the retainer, so that the flow diffuser member is press-fit in the retainer.
9. The flow-through pressure regulator of claim 8, wherein the flow diffuser member is press-fit in the retainer at the intermediate portion.
10. The flow-through pressure regulator of claim 2, wherein the flow diffuser member is disposed between the at least one aperture and the outlet.
11. The flow-through pressure regulator of claim 10, wherein the flow diffuser member is circular in form, having a cylindrical side wall with an inner diameter that is shorter than an outer diameter of the retainer, so that the flow diffuser member is press-fit on the retainer.

12. The flow-through pressure regulator of claim 11, wherein the flow diffuser member is press-fit on the retainer at the end portion.

13. The flow-through pressure regulator of claim 1, wherein the seat, the intermediate portion, and the end portion define a collection chamber in fluid communication with the passage and the at least one aperture.

14. The flow-through pressure regulator of claim 1, comprising:

a resilient element extending along the longitudinal axis and biasing the divider toward the closure member,

wherein the housing includes first and second housing parts, the first housing part including the inlet and defining the first chamber, and the second housing part including the outlet and defining the second chamber,

wherein the diaphragm includes a first perimeter sandwiched between the first and second housing parts,

wherein the base portion includes an annular portion extending outwardly from the intermediate portion relative to the longitudinal axis,

wherein the diaphragm includes a second perimeter being sandwiched between the seat and the annular portion, and

wherein the resilient element includes a first end engaging the second housing part and a second end engaging the annular portion.

15. A method of diffusing fluid flow through a pressure regulator, the pressure regulator including a divider, the divider including a seat, a diaphragm, a retainer, and a flow diffuser member, the retainer having at least one aperture, the flow diffuser member in cooperative engagement with the retainer, the flow diffuser member defining a plurality of flow paths, the divider separating a housing into a first chamber and a second chamber, the housing having a longitudinal axis, the seat defining a passage extending along the longitudinal axis between the

first and second chambers, and the diaphragm extending between the housing and the seat, the method comprising:

- flowing the fluid through the passage;
- flowing the fluid through the diffuser member; and
- flowing the fluid through the at least one aperture.

16. The method of claim 15, wherein the flowing the fluid through the diffuser member is before the flowing the fluid through the at least one aperture.

17. The method of claim 15, wherein the flowing the fluid through the at least one aperture is before the flowing the fluid through the diffuser member.

18. The method of claim 15, further comprising:

flowing the fluid from the passage through a collection chamber to the at least one aperture.